

CLAIMS:

1. A method for the synthesis of an array of polymers comprising the steps of:
 - a) providing an array of sealed flexible polymeric pouches, each pouch attached
5 to a conveyance apparatus and each pouch containing a same first reactant and a same second reactant, wherein at least one pouch contains a different volume ratio of first reactant to second reactant; and
 - b) conveying the array of sealed flexible polymeric pouches through a reaction
10 zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of polymers.
2. The method according to claim 1, wherein the providing step further comprises providing an array of pouches that are linearly joined.
- 15 3. The method according to claim 1, wherein the providing step further comprises providing an array of pouches that are linearly and horizontally joined.
4. The method according to claim 1, conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the
20 second reactant in each pouch to produce an array of 10 different polymers.
5. The method according to claim 1, conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of 30 different polymers.
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6. The method according to claim 1, conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of 90 different polymers.
- 30 7. The method according to claim 1, further comprising the step of labeling each pouch.

8. The method according to claim 1, wherein the providing step comprises providing an array of sealed flexible polymeric pouches, each pouch contains a different volume ratio of first reactant to second reactant.
- 5 9. The method according to claim 1, further comprising the step of analyzing the polymer in each sealed flexible polymeric pouch by a non-destructive technique.
10. A method for the synthesis of an array of polymers comprising the steps of:
- 10 a) providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus and each pouch containing a same first reactant and a same second reactant, wherein at least one pouch contains a different volume ratio of first reactant to second reactant, and each pouch contains a captive pouch; and
- 15 b) conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of polymers.
11. The method according to claim 10, wherein the step of providing comprises providing a captive pouch containing a portion of the same first reactant or a portion of the same second reactant.
- 20 12. The method according to claim 10, wherein the step of providing comprises providing a captive pouch containing a third reactant that is different than the first or second reactant.
- 25 13. The method according to claim 10, further comprising the step of rupturing the captive pouch and releasing material within the captive pouch into the each sealed flexible polymeric pouch.
- 30 14. The method according to claim 13, wherein the rupturing step precedes the exposing step.

15. The method according to claim 13, wherein the rupturing step follows the exposing step.
- 5 16. The method according to claim 15, further comprising the step of exposing the ruptured pouches to a controlled environment to cause the material within the captive pouch to react with the polymer in each sealed polymeric pouch.
- 10 17. The method according to claim 10, wherein the step of providing comprises providing a captive pouch attached to each sealed flexible polymeric pouch.
18. The method according to claim 10, wherein the step of providing comprises providing a captive pouch free floating within each sealed flexible polymeric pouch.
- 15 19. The method according to claim 10, wherein the step of providing comprises providing more than one captive pouch within each sealed flexible polymeric pouch.
20. A method for the synthesis of an array of polymers comprising the steps of:
- 20 a) providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus and each pouch containing a same first reactant and a same second reactant, wherein at least a first pouch and a second pouch contains a similar volume ratio of first reactant to second reactant; and
- 25 b) conveying the array of sealed flexible polymeric pouches through a reaction zone exposing the first pouch to a first set of reaction conditions and exposing the second pouch to a second set of reaction conditions, where the first set of reaction conditions are different than the second set of reaction conditions, and cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of polymers.
- 30 21. A method for the synthesis of an array of non-polymer compounds comprising the steps of:
- a) providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus and each pouch containing a same first reactant and

a same second reactant, wherein at least one pouch contains a different volume ratio of first reactant to second reactant; and

- b) conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to interact with the second reactant in each pouch to produce an array of non-polymer compounds.

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22. A method for the synthesis of an array of polymer mixtures comprising the steps of:

- a) providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus and each pouch containing a same first polymer and a same second polymer, wherein at least one pouch contains a different volume ratio of first polymer to second polymer; and
- b) conveying the array of sealed flexible polymeric pouches through a mixing zone to cause the first polymer in each pouch to interact with the second polymer in each pouch to produce an array of polymer mixtures.

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